



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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ESM1/0921

ROCKWELL INTERNATIONAL CORPORATION  
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PATENT DEPARTMENT M/A 175-100  
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ART UNIT	PAPER NUMBER
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2515

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DATE MAILED: 09/21/95

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on August 28 1995 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), — days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

**Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:**

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449.      | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152.       |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474.     | 6. <input type="checkbox"/>   |

**Part II SUMMARY OF ACTION**

1. ☒ Claims 1-24 are pending in the application.  
Of the above, claims 16-22 are withdrawn from consideration.
2. ☐ Claims have been cancelled.
3. ☐ Claims are allowed.
4. ☒ Claims 1-8, 12-15, and 23-24 are rejected.
5. ☒ Claims 9-11 are objected to.
6. ☐ Claims are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on                     . Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on                     , has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed                     , has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no.                     ; filed on                     .
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1835 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

**Part III DETAILED ACTION**

*Election/Restriction*

1. Applicant's election of Group I in Paper No. 8 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (M.P.E.P. § 818.03(a)).

*Specification*

2. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure.

The invention, as described in claim 13, asserts that there is a layer which aligns the moieties of the liquid crystal material in an adjacent layer and that this aligning layer is one of a plurality of layers each with a varying tilt angle and a varying azimuthal angle.

The disclosure describes three embodiments of a compensator for a liquid crystal display having alignment layers and discloses an additional pretilt layer between the alignment layer and the other layers forming the compensator in the two nematic embodiments, but does not disclose that any of the alignment layers or pretilt layers have varying azimuthal angles. In fact, on page 26, lines 8-10, it is stated that the layer adjacent the pretilt layer differs from the pretilt layer in that the layer has a varying azimuthal angle unlike the pretilt layer. The disclosure (see page 24, lines 13-25 and page 29, line 23, through page 30, line 4) does not describe tilt angles nor azimuthal angles in the alignment layer. For the smectic C embodiment (see page 27, lines 15-21), since the alignment layer is disclosed as being formed by oblique vapor deposition, there would be no variation in the tilt and azimuthal angles of the alignment layer.

*Claim Rejections - 35 USC § 112*

3. Claim 13 is rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.
4. Claims 23-24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 is indefinite since it depends upon claims which do not exist and, otherwise, does not properly list all claims from which it depends; i.e., dependency is claimed from claims 100, 110, etc. and only claims numbered 1-24 are current and the term "etc." leaves the group of claims open ended.

Claim 24 is rejected because it depends from claim 23.

*Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 2 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Heynderickx et al., European Patent No. 0 423 881.

Heynderickx et al. teach a compensator 16 for a liquid crystal display device wherein the compensator comprises a layer of birefringent material having an optical symmetry axis and azimuthal angle that vary along an axis normal to the layer (col. 6, lines 10-23).

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

8. Claims 1, 3-4, and 6-7 are rejected under 35 U.S.C. § 103 as being unpatentable over Heynderickx et al., European Patent No. 0 423 881, as applied to claims 2 and 5 above.

Heynderickx et al. teach a compensator comprising a birefringent layer in the form of a polymer network (col. 5, lines 49-54 and col. 2, lines 40-47) and that the liquid crystal material not polymerized is nematic (col. 5, lines 44-58), but do not teach that the birefringent material comprises a polymer matrix that defines the variation of the optical symmetry axis and that comprises polymerized nematic material, nor that such a polymer matrix includes unpolymerized nematic material, nor that the tilt angle varies along an axis normal to the layer.

Variations in tilt angle and azimuthal angle are defined by the combination of molecular orientations of the polymer network and unpolymerized liquid crystal material.

As to claims 1, 3, and 4, polymerizable nematic material is well known and, to ensure compatibility, it would have been obvious to use nematic materials that are polymerizable and unpolymerized.

As to claims 6 and 7, to provide a particular transparency or transmissivity to the compensator plate, it would have been obvious to provide a tilt angle that varies along an axis normal to the layer. Furthermore, as to claim 7, see the discussion in the rejection of claim 5.

9. Claims 8 and 12 are rejected under 35 U.S.C. § 103 as being unpatentable over Heynderickx et al., as applied to claims 2 and 5 above, and further in view of Arakawa, U.S. Patent No. 5,189,538.

Heynderickx et al. teach a compensator for a liquid crystal display having a layer comprising a birefringent material having an optical axis which varies along an axis normal to the layer, but do not teach a plurality of such layers.

Arakawa teaches a plurality of compensation layers in order to reduce viewing angle dependence (col. 1, line 48, through col. 2, line 60).

Therefore, as to claim 8, it would have been obvious to use a plurality of compensation layers, as taught by Arakawa, in the device of Heynderickx et al.

As to claim 12, birefringent layers with a plurality of moieties and alignment layers for aligning the moieties are inherent.

As to claims 14 and 15, Arakawa teach a C-plate (col. 3, lines 30-36) (as defined by the applicant on page 6, lines 4-10, of the pending application's specification) and an A-plate (col. 4, lines 24-26) (see page 12, lines 26-27, of the pending application's specification). Arakawa teaches that the combination of an A-plate and a C-plate can inhibit retardation affects based on viewing angle (col. 3, lines 53-66).

#### *Allowable Subject Matter*

10. Claims 9-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claim 13 would be allowable if rewritten or amended to overcome the rejection under 35 U.S.C. 112.

12. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

As to claims 9-11, no prior art of record teaches or suggests a compensator for a liquid crystal display in which the optical symmetry axis of each layer has an azimuthal angle which varies along an axis normal to the layer and the optical symmetry

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axes in the layers vary azimuthally in a positive sense and a negative sense respectively.

As to claim 13, no prior art of record teaches or suggests a compensator for a liquid crystal display wherein the optical symmetry axis of each layer has a respective tilt angle which varies along an axis normal to the layer with the tilt angles of the adjacent layers varying in a positive sense and a negative sense respectively and wherein the optical symmetry axis of each layer has a respective azimuthal angle which varies along an axis normal to the layer with the azimuthal angles of adjacent layers varying in a positive sense and a negative sense respectively.

### *Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Haas, U.S. Patent No. 5,375,006, teaches two adjacent compensation layers with orthogonal optical axes (col. 4, lines 18-40).

Yeh et al., U.S. Patent No. 5,196,953, teach alternating layers with different refractive indices.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter J. Malinowski whose telephone number is (703) 305-6531.

The Art Unit Fax number is (703) 308-772<sup>6</sup>/<sub>5</sub>.

wjm <sup>wjm</sup>  
September 18, 1995

*Anita Pellman Gross*  
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